TRMM Flight Operations Monthly Status Review (MSR)

June 28th, 2001

FOT Subsystem Overview

- Operations Status
  - Flight Ops Summary - Lou Kurzmiller
  - Electrical - Andy Calloway
  - Thermal - Dave Sepan
  - RCS & RF / Comm. - Dave Sepan
  - ACS & FDS / C&DH - Mark Fioravanti
  - Power & Deployables - Justin Knavel
  - LIS - Justin Knavel
  - CERES & VIRS - Mark Fioravanti
  - TMI - Dave Sepan
  - PR - Andy Calloway
  - Ground System - Dan Palya
  - Upcoming Activities - Andy Calloway

Flight Operations Summary

- Supported 543 SN events in June
  - 1 Yaw Maneuver
  - 7 Delta-V Maneuvers
- 1 Anomaly Rpt; 1 Event Rpt
  - AR #90: DSS B Marked Bad by ACS S/W; due to Solar Eclipse
  - ER #238: SN; 1 Confirmed Event given up for LSAT-4

Flight Operations Summary

- Notable Events
  - Solar Array 55 deg Off-pointing testing at Beta Angles of near 0 & 55 degrees
  - Enabled Auto-SPRU at high Beta periods; monitoring performance
  - PACOR -A ORR
  - 400 Km Boost Dry-run
  - FOT personnel status
    - One console analyst joined FOT

Flight Ops Summary

SPECIAL SPACECRAFT EVENTS AND ACTIVITIES FOR TRMM 2001

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
2	8	7	10	12	8	7							52
2a	1	1	1	2	1	1							7
2b	0	0	0	0	0	0							0
2c	0	0	0	0	0	0							0
3	1	0	1	1	0	1							4
3a	1	4	2	9	3	5							24
3b	3	2	1	3	2	0							11
3c	1	1	1	5	1	1							10
3d	0	0	0	0	0	0							0
3e	1	0	0	0	1	2							4
3f	2	2	5	2	2	0							13
4	3	1	0	0	1	0							5
4a	0	2	2	2	2	4							12
4b	1	1	2	1	2	1							8
4c	0	0	0	0	6	0							6
4d	5	0	3	8	4	0							20
4e	0	0	0	1	0	12							13
5	3	0	2	4	1	2							12
5a	0	0	0	0	5	4							9
5b	0	5	0	0	0	0							5
5c	0	0	0	0	0	0							0
TOT	30	26	30	50	39	40	0	0	0	0	0	0	215

LEGEND

STANDARD CATEGORIES		TRMM-SPECIFIC SUB-CATEGORIES AND EXAMPLES
1	Targets of Opportunity	N/A
2	S/C Maneuvers	DeltaVs **(2)** , 180° Yaw Maneuvers **(2a)** , 90° Yaws **(2b)** , Deep Space Cals **(2c)**
3	Unplanned Commanding	Blind Acqs **(3)** , Patch Loads **(3a)** , Manual DS Ops due to Blind Acqs, MI, etc. **(3b)** , EPVs Fail **(3c)** , VIRS Reset Ops **(3d)** , Anomaly Recoveries **(3e)** , Generic Late Acqs - GCMRs / DS Ops **(3f)**
4	Customer Requests	PR **(4)** , VIRS **(4a)** , LIS **(4b)** , CERES **(4c)** , FSW **(4d)** , AETD **(4e)**
5	Ops due to Celestial Phenomena	UTCF / FS Ops **(5)** , Power Ops - Autospru, TSMs, C/D **(5a)** , Xpdr Offset Ops **(5b)** , Leonids **(5c)**
6	Pre-Launch Testing	N/A
7	L&IOC Operations	N/A
8	EOL Operations	Delta-H Firings **(8)** , Reentry Maneuvers **(8a)**

NOTE: This Record Documents S/C Activities and Does Not Include Other Special Activities Such as Ground System Testing, Simulations, Trending, or New Database, Script, Code, or Procedure Development...

Thermal / Electrical Subsystems

- The Thermal subsystem remains nominal
  - No operational issues during the 401 km boost or operationally after arrival

- The Electrical subsystem remains nominal
  - No operational issues during the 401 km boost or operationally after arrival

RCS Subsystem

- RCS performed 7 successful Delta-V maneuvers (#311 - #317)
  - Current fuel remaining is 402.192 kg
- EOL estimate at the current altitude is approximately **March, 2003**, using 157kg of fuel as a baseline.
- No Open RCS Anomaly or Event Reports
- Upcoming Events
  - Review of RCS Subsystem for 401 km boost is complete with no open issues or concerns.
  - Begin review of, and training in, Delta-H procedures, EOL scripts, and a “one-shot” procedure.
  - Review all required steps for a 30+ minute Delta-V maneuver and test with the simulator.

RF Subsystem

- No Generic Late Acquisitions
- Frequency offsets (monthly average)
  - Transponder #1 = +719.293 Hz
  - Transponder #2 = -728.578 Hz
- No RF Event Reports or MOCRS this month
- Upcoming Events
  - Offset of transponder 2 frequency may still occur this year.

ACS Subsystem

- Solar Array Off-Pointing Tests.
  - 1st on 01-150 (Wed., May 30th)
  - 2nd on 01-176 (Mon., June 26th)
  - 3rd is expected on 01-185 (Wed., July 3rd)
  - See Power Section for more details.

ACS Subsystem

- ACS DSS/Yaw Update Failure (Anomaly #90)
  - 01-172 (Thrus., June 21st) A Yaw Update was expected to occur at 13:51:37, and did not. ACS flagged DSS-B as bad.
  - DSS-B was marked good after consulting with ACS AETD, to prevent a possible transition Sun Acq. If DSS-A and DSS-B are both marked bad, ACS would transition to Sun Acq.
  - A new EPV was uplinked as a precaution. Subsequent Yaw Updates were performed as expected.
  - It was realized there had been an eclipse that day in Africa. The geolocation of TRMM at the time of the expected Yaw Update was over Madagascar.
  - TRMM never crossed the path of totality, but entered far enough into the areas of partial eclipse, for the DSS-B reading to drop to Zero. The solar intensity drop was approximately 30% at max. The Yaw Update just happened to occur at the time the DSS-B was reading Zero, fooling the ACS S/W into thinking there was a DSS-B failure.

FDS/C&DH Subsystems

- UTCF Status;
  - Two Adjustments were performed. One on 01-154 (Fri. June 3rd), and the other on 01-171 (Wed., June 20th). The next adjustment is expected on 01-190 (Mon., July 9th)
  - Current UTCF value is 31535996.822907 sec
  - No FS Adjustments were performed, current value is x'7C6'. The next Adjustment is expected on 01-215 (Fri., Aug 3rd), and will be adjusted to x'7D2'.
- Planned RTS Changes
  - Nominal TDRS AOS RTS format changes to allow easier modification as DS storage status changes, and to simplify transponder offsets if required.
  - Initially will be performed with RTSs 65 – 68, then if all works well, other AOS RTSs may be converted.

Power Subsystem

- On 01-172 (June 21st), Auto-SPRU was enabled on PSIB B to prevent overcharging at high Beta angles.
  - The telemetry dropout shift, which occurred the previous time Auto-SPRU was enabled, has reappeared (AR#89).
- Off-pointing the Solar Array by 55 degrees
  - A successful 2 orbit Solar Array off-pointing test was conducted on 01-176 (June 25th). The Beta angle was approximately 58 degrees.
  - The next off-pointing test will be conducted the first week of July, when the Beta angle will be near 26 degrees.

Deployables Subsystem

- Solar array drives and HGA continue to operate nominally.

LIS Instrument

- One Routine MSFC real-time command request was performed on 01-169 (June 18th) to reduce packet sequence errors
- No open issues

CERES/VIRS Instruments

- **CERES**.
  - Powered OFF.
- **VIRS**, continues to operate nominally.
  - Two sets of VIRS Solar Calibrations were performed on 01-143 (Sat., June 9th).
  - Would like to be notified as soon as possible when the Boost date has been decided on.
    - » Require a set of Solar Calibrations, before the boost, and another set after the boost has been completed and TRMM has obtained nominal attitude.
    - » No other Calibrations are planned.

TMI / PR Instruments

- No Open Issues with the TMI instrument
  - TMI will remain operational during the 401 km boost period and science data will continue to be used for realtime weather-related operations

- No PR External Cals or LNA Analysis routines were performed in June
- One new PR interference site was reported by NASDA in June. Research shows this is probably a new earth station in Ras Abuharjor, Saudi Arabia at 26.10N, 50.61E that transmits to ARABSAT-2A and 2B (26.5E & 30E)
- PR will remain powered on during the boost to 401 km unless spacecraft power becomes a concern
- The command sequences which will be performed with PR after the boost to 401 km are being worked out with NASDA at this time

Ground System

- PACOR-A PC completed final Security acceptance and has been installed on the closed network. File transfer and printing capabilities have been verified.
  - ORR was conducted on June 13th. PACOR-A will become operational after the ORR review board re-convenes to approve all RFA/AI closures
  - Two operational issues remain: PC menu will be upgraded to show data capture at the frame level instead of only block level; Level-0 data request function is not yet operational (still grayed out at MOR)
- Open Network Security scan was conducted June 11th - 12th
- Quarterly GITT Security scan was conducted on June 26th
- System Software Release 9.1 will not be installed; 9.0 will be the operational baseline for all strings and SOTA bay
- TOR decommissioning tests were successful with new MSOCC configuration for both forward and return link capabilities
- The TRMM FOT Web Server PC experienced a s/w failure on June 19th, and was restored to full operations by June 21st
- Ground System at MOC and SOTA-7 ready to support boost activities; all software will be frozen at least two weeks prior to start

Upcoming Activities

- 0-2 Months
  - Complete Rel 9.0 installation to all strings and freeze prior to boost activities
  - Complete RAM to EEPROM transfer for remaining tables prior to boost activities
  - Perform necessary scheduling and training activities and generate timeline of events for 401 km boost activities
  - Perform successful ascent maneuvers to the new 401 km operational altitude
  - Establish new trend baseline for full seasonal changes at the new operational altitude
  - Begin operations with the new PACOR-A system and new web-based user interface
  - Test and install new Transponder-2 AOS Offset Relative Time Sequences
  - Complete SA 55° offset test for beta angle of 26° and a long-duration test
  - Test and install new TDRS HGA AOS RTSs

Upcoming Activities

- 2-3 Months
  - Complete testing and training with PSIB alternate telemetry patch
  - End Of Life Planning, Testing, and Simulations continue
  - Continue to close open CCRs, MOCRs, and MSR Action Items
  - Leonids 2001 will occur in November